AY11 Continuous Process Improvement for Strategic Leaders
IP05

Department of Leadership and Strategy

Col PJ McAneny
AWC/DA

We Produce the Future

Plan for the Day

- 1st Hour – Quick Admin / Honda Motors' "Kick Out the Ladder" / Review of Value Stream Management Practices
- 2nd Hour – Value Stream Management Video and Discussion
- 3rd Hour – Review of Assigned Reading

Admin Moment

- **Case Study Analysis Requirements**
  - Teams and Topics to me COB today
  - Address all 7 Learning Objectives in your 3-4 page written analysis
  - Load in folder by COB day prior to scheduled class
- **Reading for this IP05**
  - Suggested Womack and Jones reading (Lean Thinking, p 50-98) highly encouraged for anybody interested in Lean supply warehousing
- **Personal Lean Moment**
  - Song, Halsey, and Buress, "*The Hamster Revolution*"

Honda Motors: “Kick Out the Ladder”

Course Design

This course is organized in 4 parts:

- History/Current Status (IP01)
- Culture Change (IP02 and IP03)
- Tools and Techniques (IP04-IP07) – Value Stream Mapping
- Understanding/Applying Transformation Tools of the Trade (IP08-IP10)

Value Stream Mapping

Objectives

- Learn the concept of Value Stream Mapping
- Discuss concept and value of creating a Current State Map
- Show a map in construction (on back-up slides)

Value Stream Mapping

"Whenever there is a product for a customer, there is a value stream. The challenge lies in seeing it."

"Learning to See"

Rother & Shook

Lean Enterprise Institute 1999

Foreword by Jim Womack and Dan Jones

Lean Transformation

1. Find a change agent.
2. Find a teacher.
3. Seize (or create) a crisis to motivate action.

5. Pick something important and get started removing waste quickly.

"Learning to See"
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Lean Enterprise Institute, 1999
Foreword by Jim Womack and Dan Jones

Lean Transformation

1. Find a change agent.
2. Find a teacher.
3. Seize (or create) a crisis to motivate action.
4. ***Map the entire value stream for all your product families.***
5. Pick something important and get started removing waste quickly.

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What is VSM?

- Definition: Everything that goes into creating and delivering value to the end customer… including waste
- Method to visualize entire process - see customer value flow
  - Value Added Elements
  - Non-Value Added Elements
- Display relationships between material and information
- Make waste and its sources visible
- See linkages between suppliers, operations and customers

“Enterprise” Value Stream Mapping

- Encompasses the product life cycle, support, and leadership processes.
- Portrays the relationships of the enterprise to its external environment and the general ordering of the high-level internal enterprise processes.
- Mapped to identify sources of waste and opportunities for value creation at the enterprise level.
- Consider the USAF’s new High Velocity Maintenance Initiative

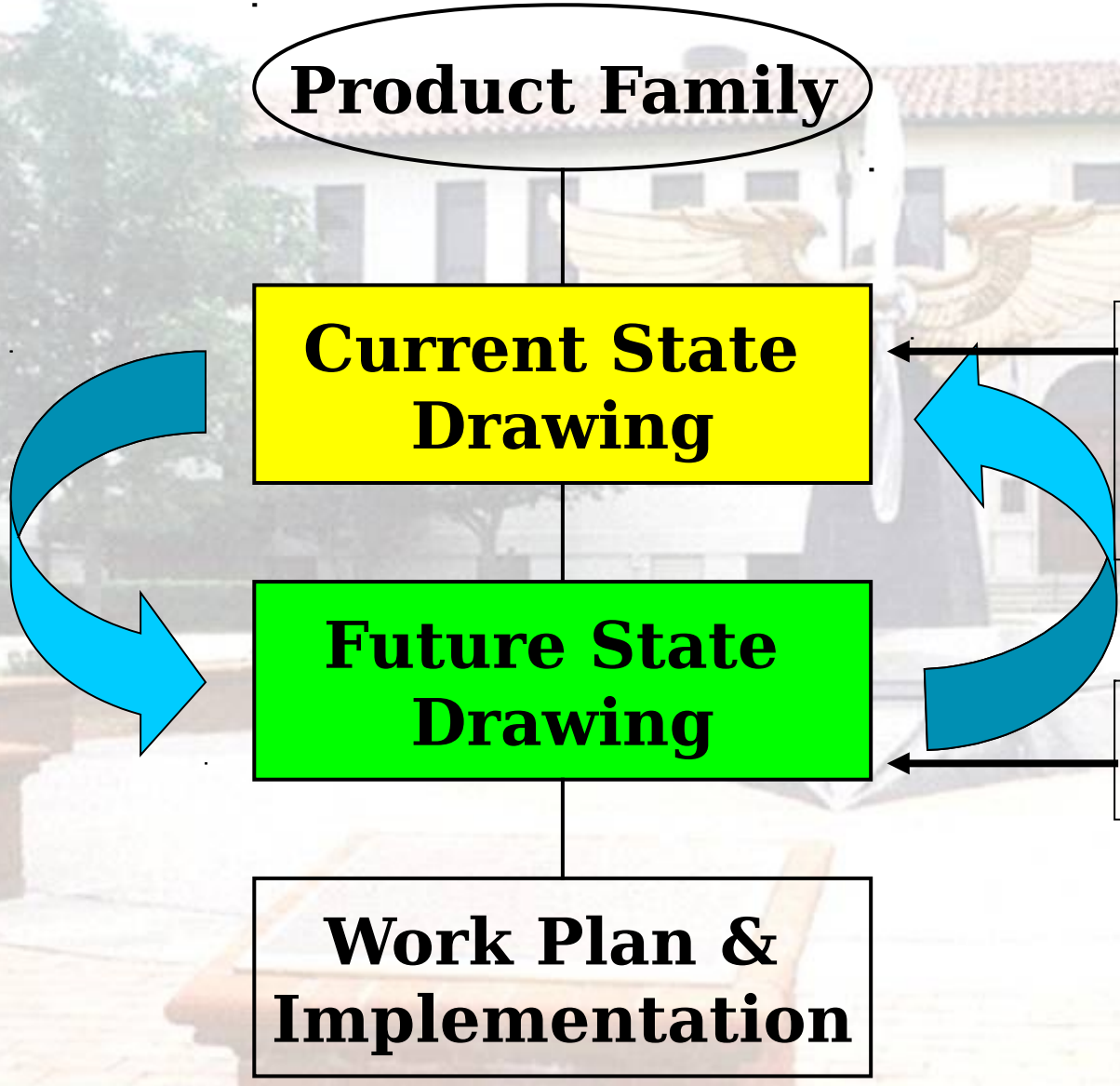
Value Stream Mapping vs. Process Mapping

- Value Stream Maps are more strategic-level versus Process Maps are more operational/tactical-level.
- Incorporates more detail.
- Look at more than just the process inputs/outputs - it incorporates the management and information systems that support the process.
- Used to identify future projects and/or events.

Why is it essential?

- Common language and basis for discussion
- Good tool for getting the big picture
- Ties together concepts and tools:
  - 8 kinds of waste
  - Rapid improvement events (RIEs)
  - One piece flow
  - Takt time
- Helps avoid “Cherry Picking” tools
- Basis for implementation plan

VSM Flow



Understanding how the process Currently Operates – the foundation for the future state.

Workable "Vision" – 6 to 12 months in future.

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Comparison of Traditional vs. Lean Value Stream Cultures

Traditional Culture

- Most people understand only the functions in which they work
- Functions are competitors
- A function's Measures isolate it from other functions

Value Stream Culture

- People understand the big picture and the business of the other functions
- Functions are partners
- Common Goals (Order to Ship Time, Information accuracy and timeliness, etc.)

Selecting Product/Service Family

- Focus on one product/service
- Product family as customer views it
  - How many finished products
  - How much is wanted
  - How often is it wanted
- Grouping by similar processing steps, common equipment, common skills, … Sometimes by customer grouping
- Choose family with high demand or strategic importance

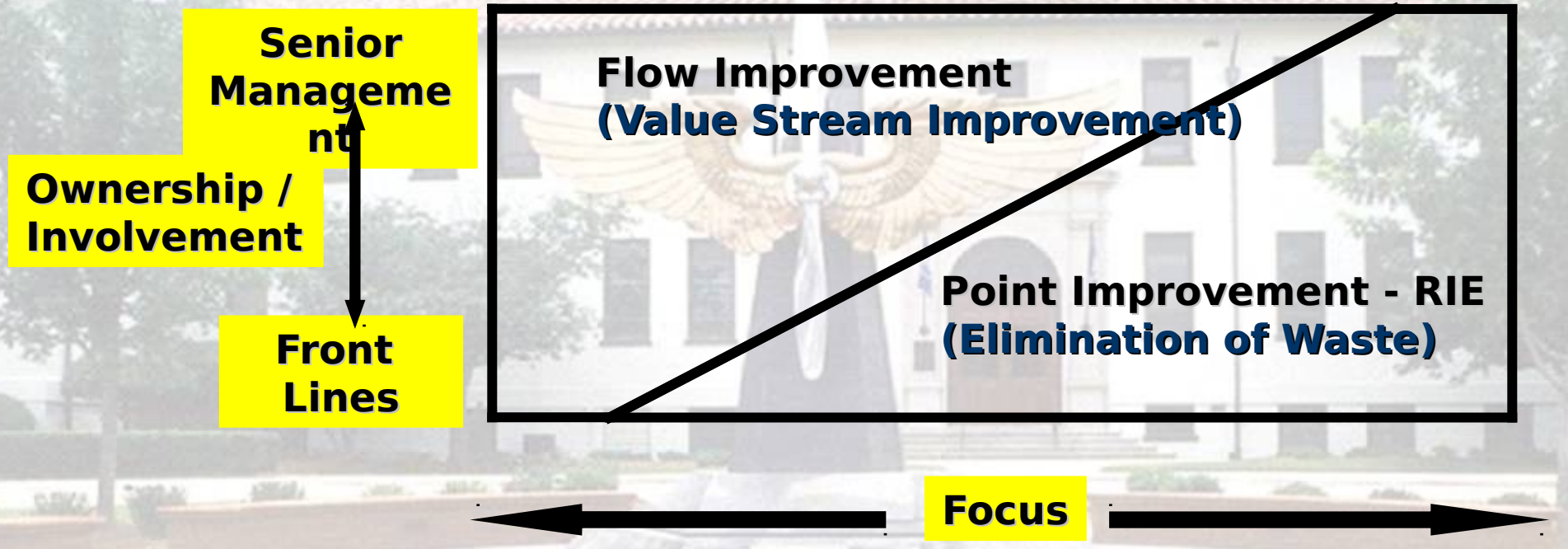
Dedicated Product Teams

- - Is organizing in this fashion a better way to hear the voice of the customer?

- - Was Gen Creech ahead of his time? Are centralization efforts like finance, legal claims, and centralized supply a move away from this or a move toward this concept?

Manufacturing Insights: “Mapping Your Value Stream”

Two kinds of Improvement



Value Stream Improvement is *Flow Improvement* – or "Leadership Improvement"

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Leadership's Role

- Value Stream Improvement is Leadership's Responsibility
  - Current State Map – *analysis of current process that Leadership needs to understand*
  - Future State Map – *Vision of Future (owned by leadership)*
  - Action Plan – *Commitment of Resources*
  - **Therefore, can not be delegated!**
- May drive Organizational Decisions (VSM Mgr.)
- Should eventually evolve to Policy Deployment

What do Womack and Jones say about working with downstream suppliers? (*Lean Thinking*, p. 46-47) How does this relate to what you have been studying in the JSL course?

What do Womack and Jones Say About Benchmarking?



What do Womack and Jones Say About Benchmarking?

- - Benchmarking is a waste of time for managers that understand Lean thinking (*PJ's comment…it's better perhaps for managers/leaders to benchmark so they <u>can</u> understand Lean thinking.*)

- - Instead, managers should compete against *perfection* by identifying all activities that are waste and eliminating them.

Material & Information Flow

- Information flow just as important as material flow.
- Focus on flows and customers instead of tasks.
- Information so process makes only what is needed when it’s needed – examining how we know what to do, and when.

Current State Map

Drawing the current state map

- Determine level of mapping
  - Process *(Process Sequence Chart)*
  - Plant
  - Multiple plants
  - Across companies
- Usually – best to begin at plant level
  Note: Sometimes “plant” = site (or “base” in the military)

Customer Focus

- Value added is always determined from the customer's perspective—Who is the customer?
- Every process should be focusing on adding value to the customer.
- Anything that does not add value is waste.
- Some non-value added activity is necessary waste.

The Three Elements of Every Value Stream

- Value Added
- Non-Value Added, but Required
- Waste

Consider the Value Stream Womack and Jones displayed for producing Cola. (*Lean Thinking*, P. 38-48)

“Process” Perspective

- Products and services are delivered to our customers through a series of work *processes*, not as the result of any *one* function.
- We must maintain a *Process* view of our business.
- We must distinguish between serial processes and parallel processes.

Value Stream Mapping Steps

1. Identify the customer requirement.
2. Identify the problem with the current process from the customer/organization perspective.
3. Walk the ENTIRE process to see/identify all of the steps of the process.
   - Have the entire team walk the flow
   - Include information flow as well as product flow
4. Record the data (the real data) for each step within the current state value stream. This tells people how the work is actually being done right now.
5. Identify which steps add value to the process (from the customer perspective), which are non-value added (from the customer perspective) and which are non-value added, but required.
6. Create a revised value stream map with the removal/reduction of the identified WASTE, to show the future state process.

Tips for efficient and effective mapping

- Collect current information at actual site of process (don't use data in notebooks, design information, etc…)
- Start with a quick walk of the entire stream (might take a couple of hours) – not for data collection, but for overview
- Begin at customer end (shipping) and work upstream
  - Allows critical questions related to information flow
    - How do you know what to work on when?
    - Where do you get your information/supplies?
- Bring watch or stopwatch in case of need
- Give significant fore-thought and efforts to gathering the correct data about each of the processes – process steps without data is only partially useful
- By hand, in pencil
- Don't divide the map into segments to be done by different people – do it all together!

VSM Current State Key Takeaways



VSM Current State Key Takeaways

- All process improvement begins with understanding how the process currently works
- Value Stream Mapping is an effective tool for mapping the process flow and the information flow that controls the process
- The information flow controlling the process is often the source for much of the waste in the process
- VSM can be applied at multiple levels of processes and for any type of process

IP06

Lean / Six Sigma

The Intellectual and Leadership Center of the Air Force

We Produce the Future…

One Student at a Time

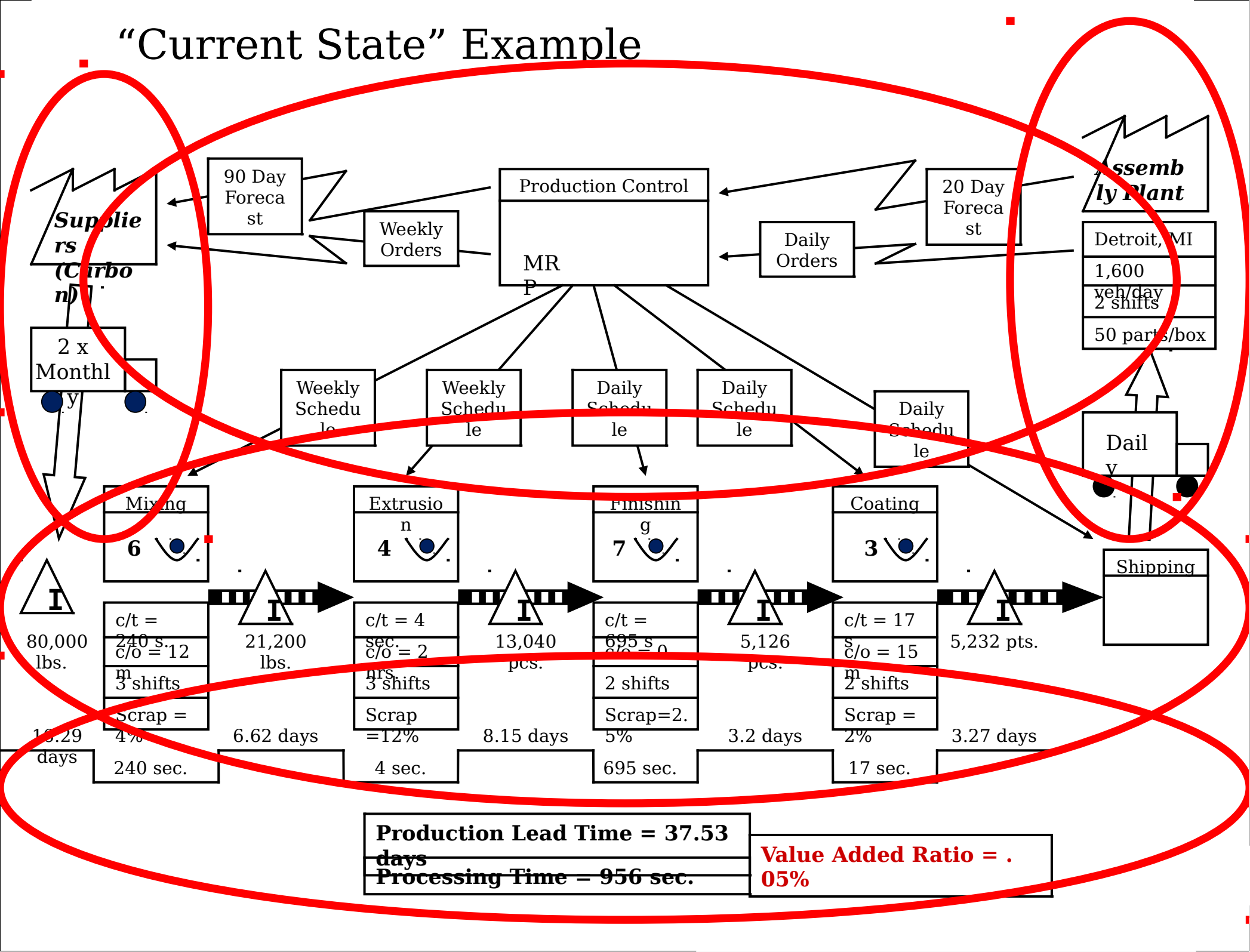
One Faculty Member at a Time

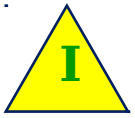
One Idea at a Time



Backup Slides

“Current State” Example

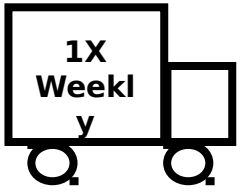




Inventory - Product that is not being worked on



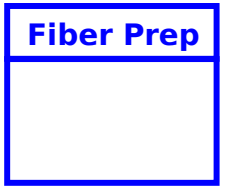
Factory - a Customer or Vendor facility



Transportation - Indicates shipment of Product to/from exter



Functional Group - Processes Information but adds no Value to Product



Process Box - Area where Value is added to Product, Relevant Data is recorded under process box in a Data Box

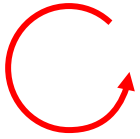
Value Stream Mapping Symbols



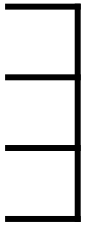
Push Arrow - indicates Product is pushed into next process



Flow Arrow - Indicates Product Flows from one process to an



Pull Arrow - Indicates Process or Customer pulls Product from previous process or Vendor



Supermarket (Kanban) - Small Inventory of Product from wh next Process or Customer may Pull



Information Flow - Indicates flow of information regarding Part #, Quantity and Delivery Schedule



Electronic Information Flow - Indicates flow of information in electronic format

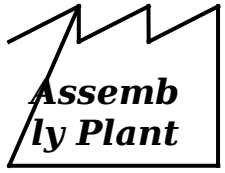
Creating the Map

1. Begin with the Customer
   - Place in upper right section of map
   - Include key data (location, demand, hours, etc.)

"Learning to See"
Rother & Shook

Lean Enterprise Institute, 1999
Foreword by Jim Womack and Dan Jones

“Current State” Example



Detroit, MI
1,600 veh/day
2 shifts
50 parts/box

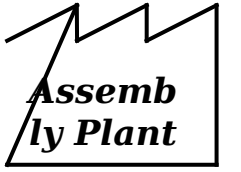
Creating the Map

1. Begin with the Customer
   - Place in upper right section of map
   - Include key data (location, demand, hours, etc.)
2. Processes go left to right on bottom half of map
   - Process is any area where product is flowing (cell)
   - Areas separated by WIP are separate process boxes
   - Include key data (c/t, c/o, operators, scrap, shifts, etc.)

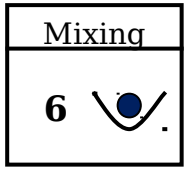
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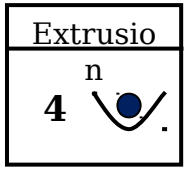
“Current State” Example



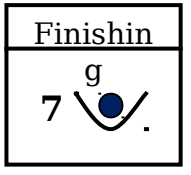
Detroit, MI
1,600 veh/day
2 shifts
50 parts/box



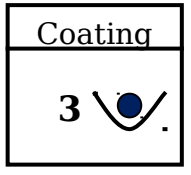
c/t = 240 s.
c/o = 12 m
3 shifts
Scrap = 4%



c/t = 4 sec.
c/o = 2 hrs.
3 shifts
Scrap =12%



c/t = 695 s
c/o = 0
2 shifts
Scrap=2.5%



c/t = 17 s
c/o = 15 m
2 shifts
Scrap = 2%



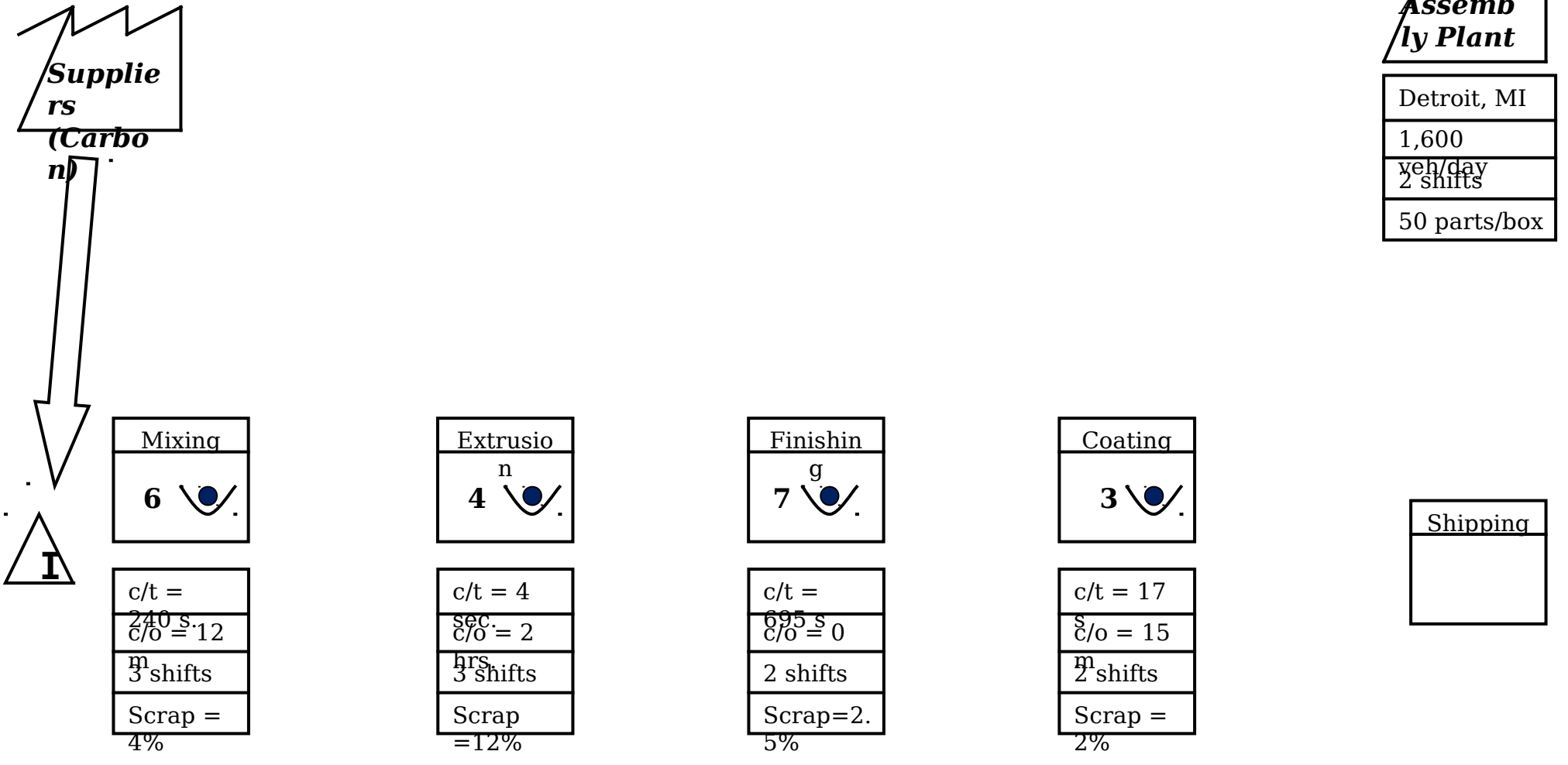
Creating the Map

1. Begin with the Customer
   - Place in upper right section of map
   - Include key data (location, demand, hours, etc.)
2. Processes go left to right on bottom half of map
   - Process is any area where product is flowing (cell)
   - Areas separated by WIP are separate process boxes
   - Include key data (c/t, c/o, operators, scrap, shifts, etc.)
3. Suppliers are placed in upper left
   - Map only key purchased components
   - Include key data

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“Current State” Example



Creating the Map (cont.)

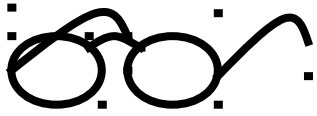
4. Indicate Information Flow
   - Flow is drawn right to left on upper half of map
   - Information flows to map include:
     - Customer Forecast and Orders
     - Supplier Forecast and Orders
     - Scheduling Information to Processes
     - Scheduling Information to Shipping

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Information Flow

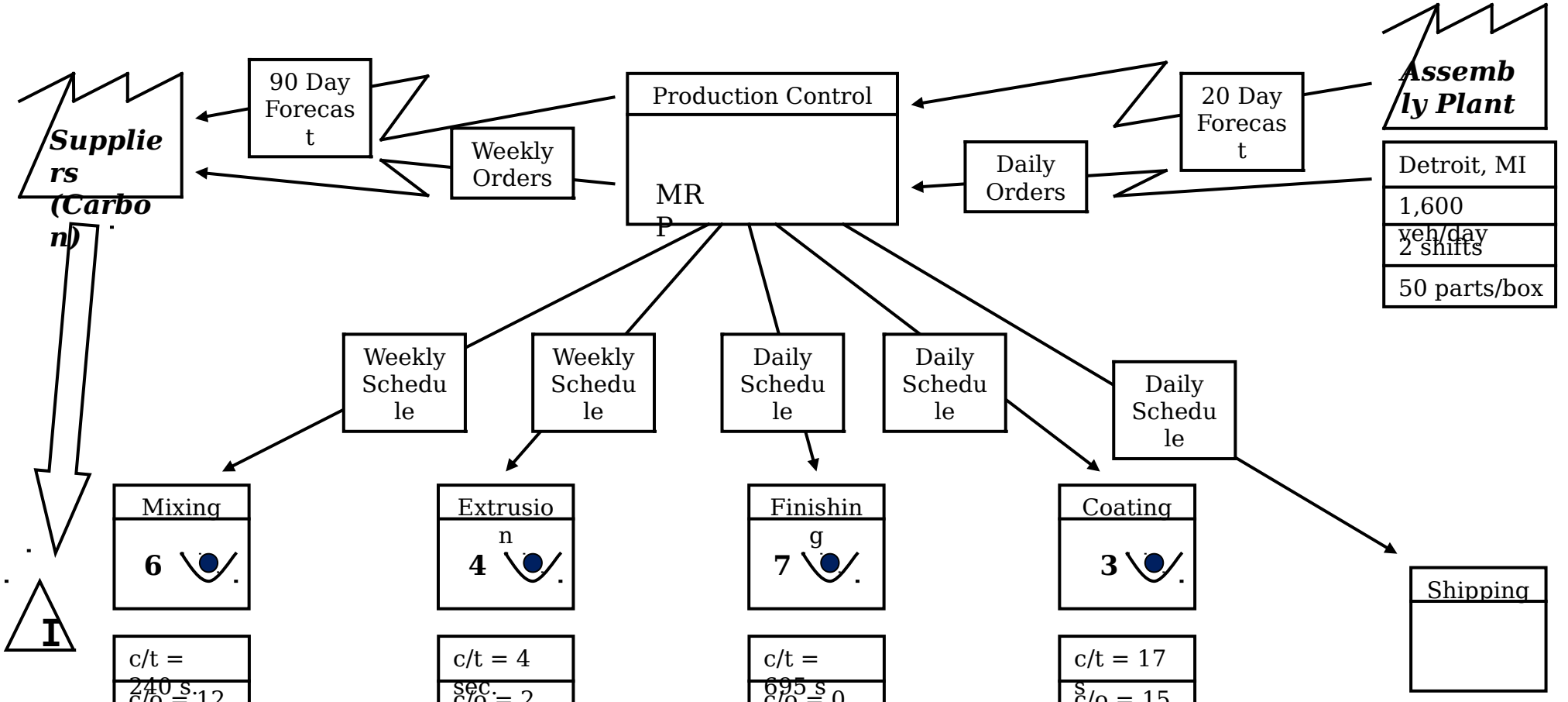
- Information flow
- Electronic information flow
- Formal / informal - MRP vs. supervisor request
- ‘Go see’ - look and request



- Push and push arrow
  - Push - producing without a request from customer process.



"Current State" Example



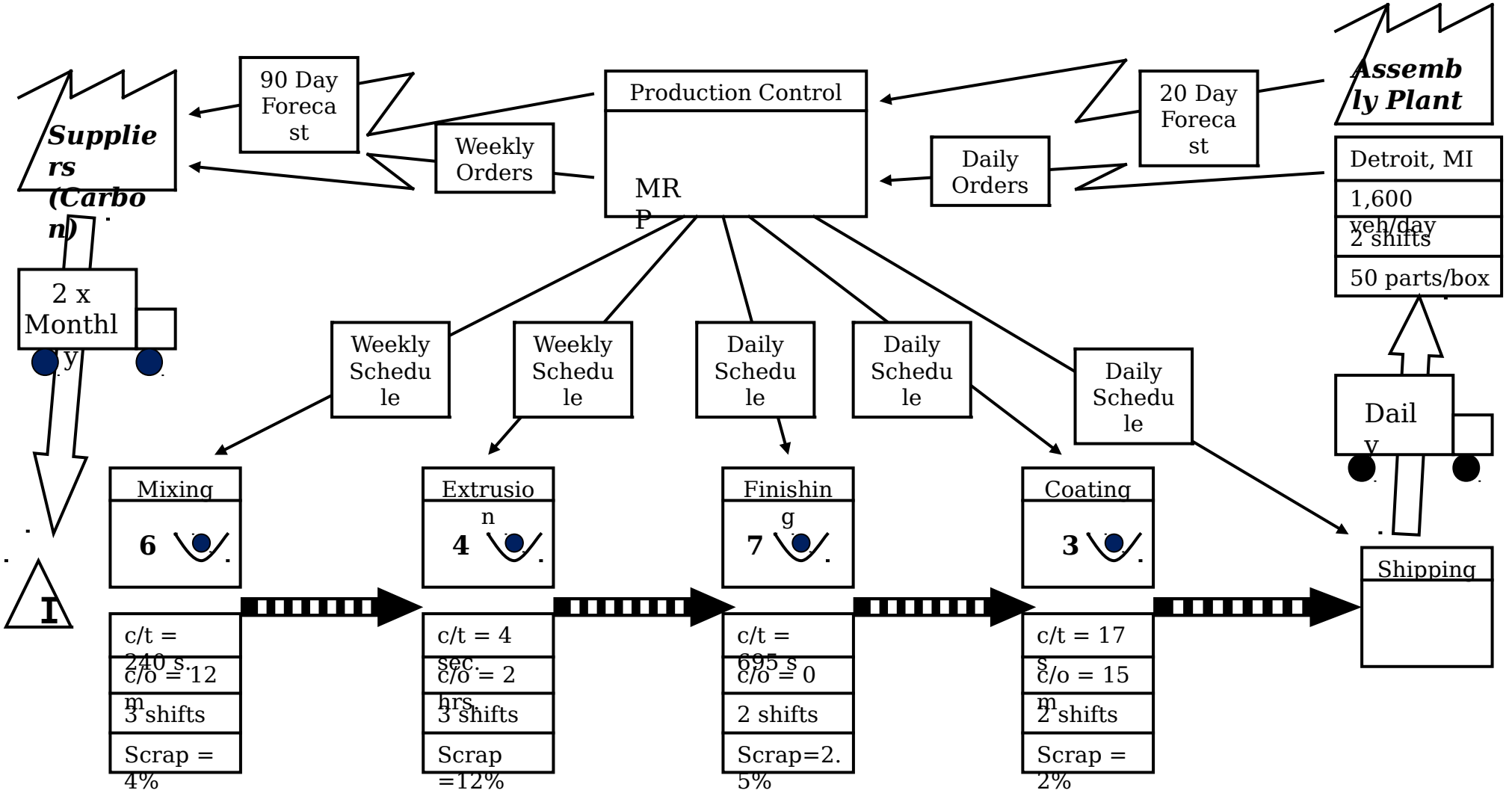
Creating the Map (cont.)

4. Indicate Information Flow
   - Flow is drawn right to left on upper half of map
   - Information flows to map include:
     - Customer Forecast and Orders
     - Supplier Forecast and Orders
     - Scheduling Information to Processes
     - Scheduling Information to Shipping
5. Connect All Icons with Appropriate Symbols
   - Push Arrows if scheduled separately
   - Pull Icons if linked by KanBan or Supermarket

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"Current State" Example



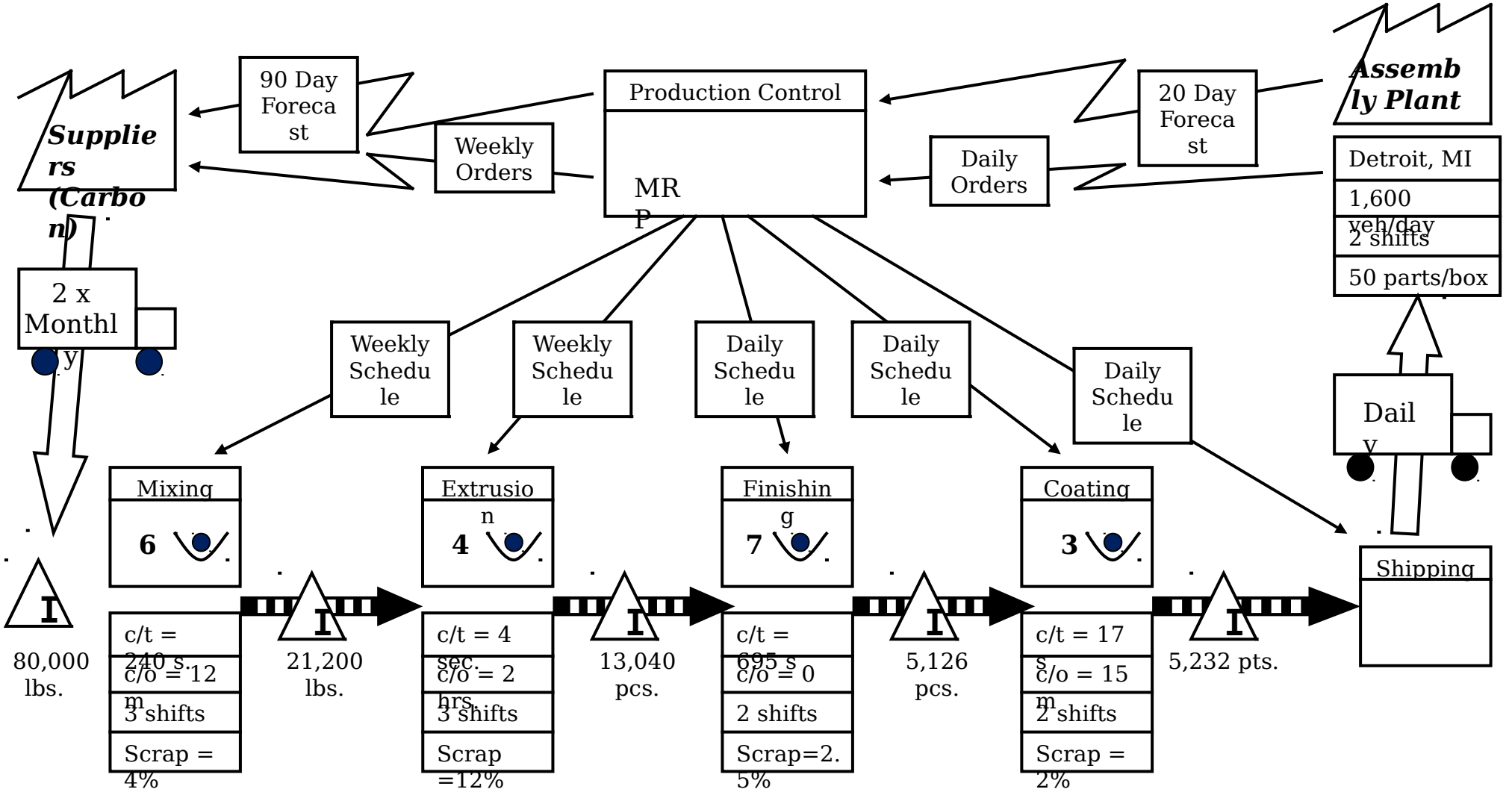
Creating the Map (cont.)

6. Indicate Inventory Locations and Amounts
   - Number of Parts or Pieces
   - Number of Days of Production

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"Current State" Example



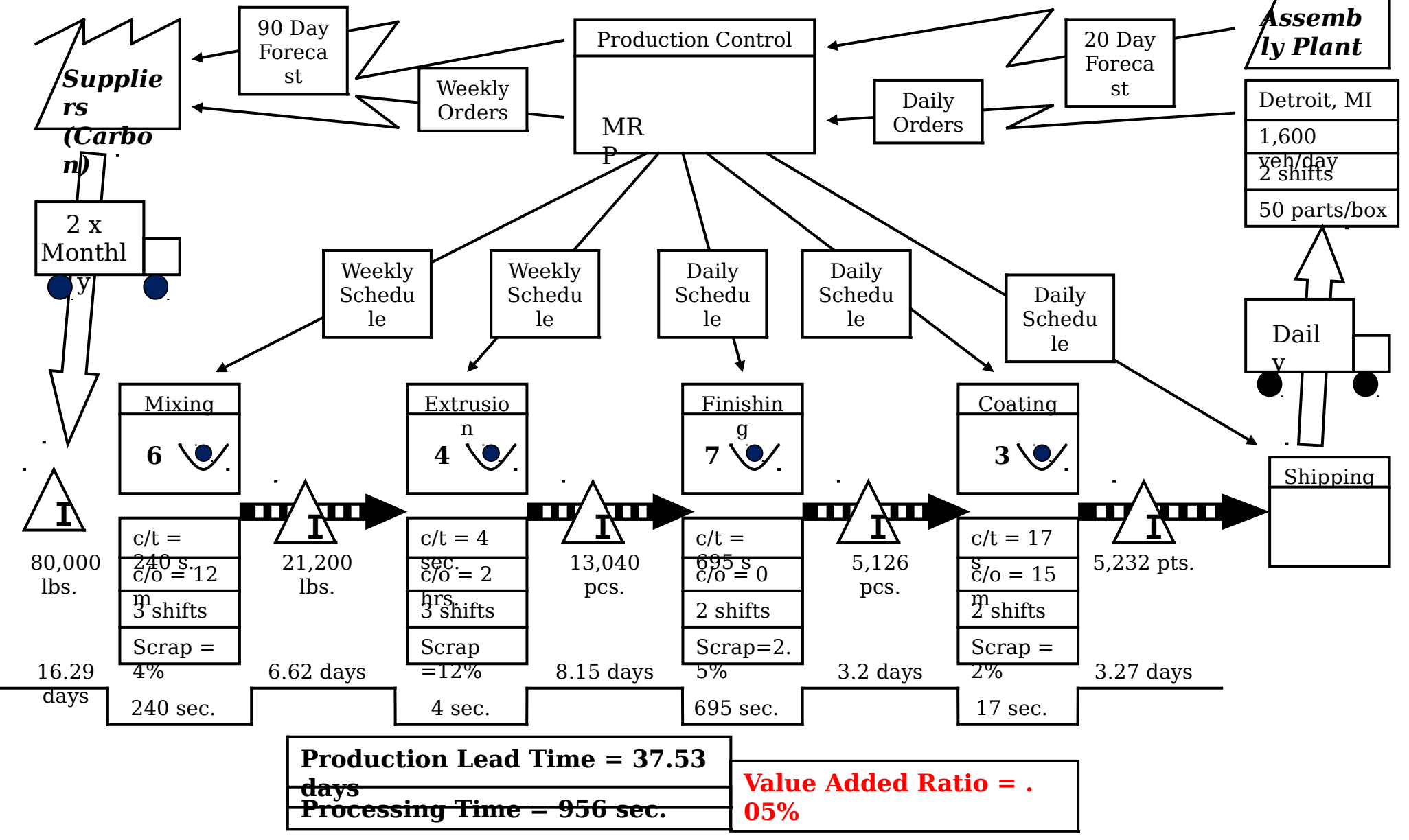
Creating the Map (cont.)

6. Indicate Inventory Locations and Amounts
   - Number of Parts or Pieces
   - Number of Days of Production
7. Measure Current Flow
   - Lead Time in Days (hours if appropriate)
   - Process Time in Seconds
   - Calculate VA Ratio (Process Time / Lead Time)

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"Current State" Example



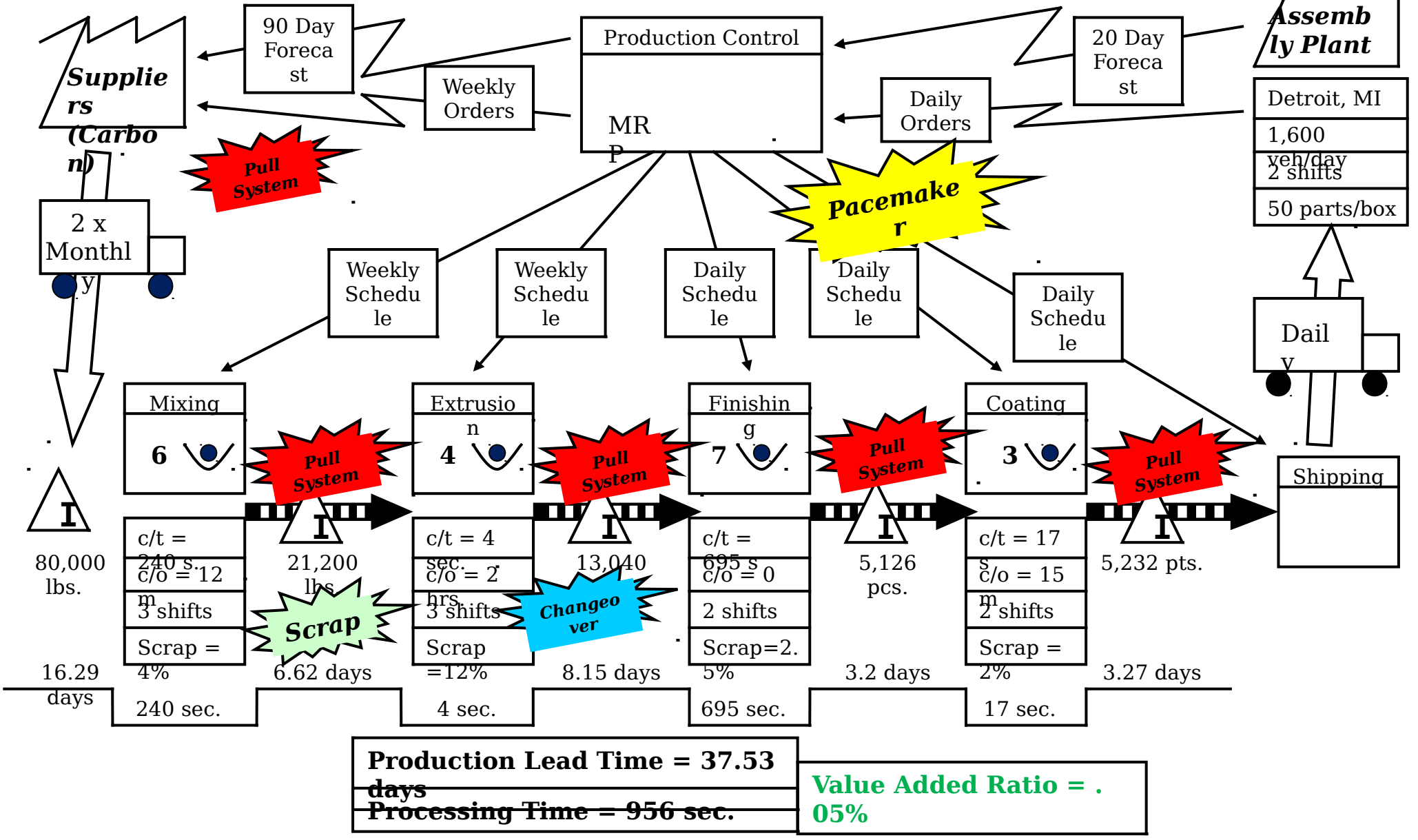
Creating the Map (cont.)

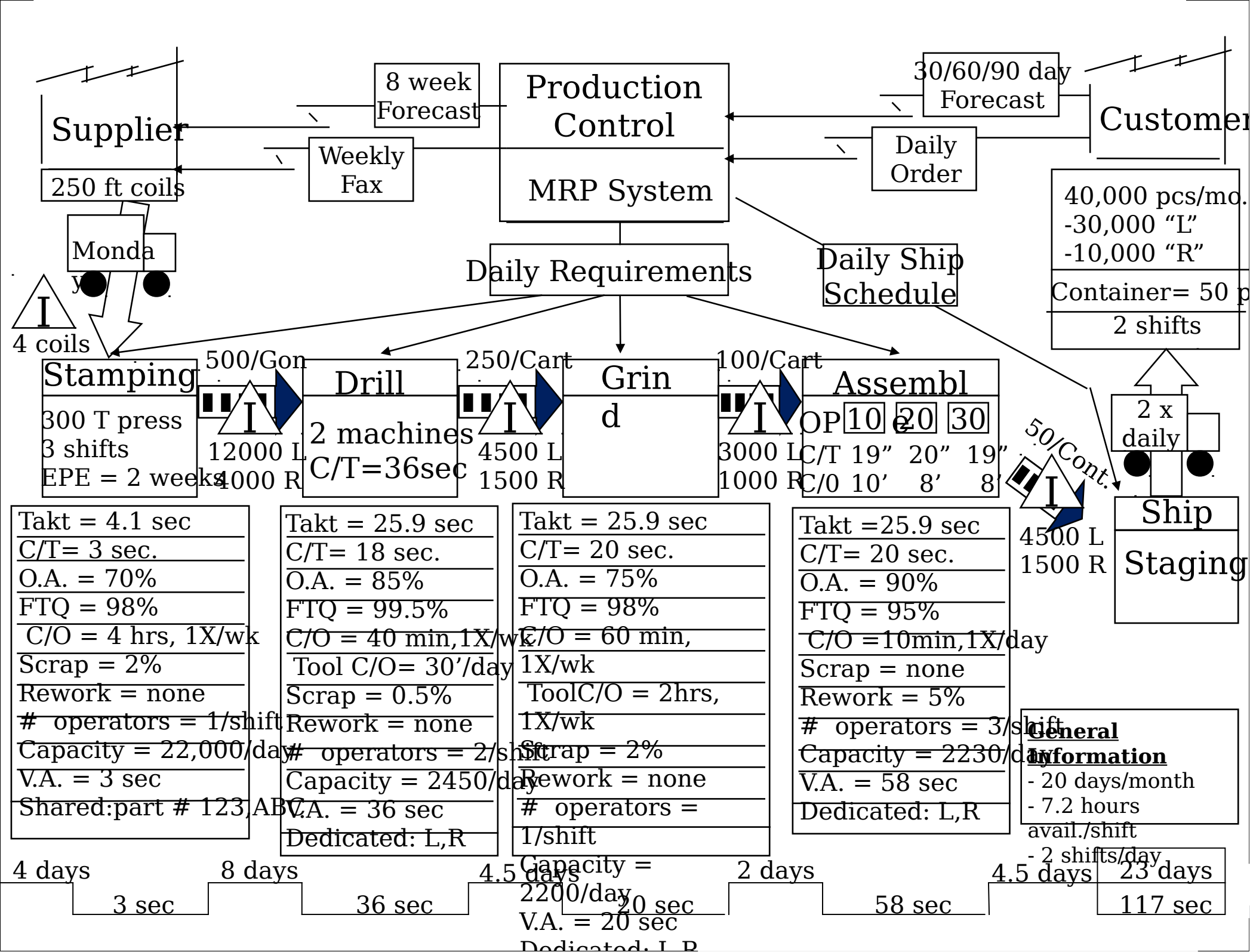
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   - Number of Parts or Pieces
   - Number of Days of Production
7. Measure Current Flow
   - Lead Time in Days (hours if appropriate)
   - Process Time in Seconds
   - Calculate VA Ratio (Process Time / Lead Time)
8. Insert “Kaizen Lightning Bursts”
   - Show possible improvements on Current Map

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"Current State" Example




Supplier
250 ft coils
Monda
y
4 coils
8 week
Forecast
Weekly
Fax
Production
Control
MRP System
Daily Requirements
30/60/90 day
Forecast
Daily
Order
Customer
40,000 pcs/mo.
-30,000 "L"
-10,000 "R"
Container= 50 p
2 shifts
Daily Ship
Schedule
500/Gon
250/Cart
100/Cart
50/Cont.
Stamping
300 T press
3 shifts
EPE = 2 weeks
12000 L
4000 R
Drill
2 machines
C/T=36sec
4500 L
1500 R
Grin
d
3000 L
1000 R
Assembl
OP 10 20 30
C/T 19" 20" 19"
C/O 10' 8' 8'
4500 L
1500 R
2 x
daily
Ship
Staging
Takt = 4.1 sec
C/T= 3 sec.
O.A. = 70%
FTQ = 98%
C/O = 4 hrs, 1X/wk
Scrap = 2%
Rework = none
operators = 1/shift
Capacity = 22,000/day
V.A. = 3 sec
Shared:part # 123,ABC
Takt = 25.9 sec
C/T= 18 sec.
O.A. = 85%
FTQ = 99.5%
C/O = 40 min,1X/wk
Tool C/O= 30'/day
Scrap = 0.5%
Rework = none
operators = 2/shift
Capacity = 2450/day
V.A. = 36 sec
Dedicated: L,R
Takt = 25.9 sec
C/T= 20 sec.
O.A. = 75%
FTQ = 98%
C/O = 60 min,
1X/wk
ToolC/O = 2hrs,
1X/wk
Scrap = 2%
Rework = none
operators =
1/shift
Capacity =
2200/day
V.A. = 20 sec
Dedicated: L,R
Takt =25.9 sec
C/T= 20 sec.
O.A. = 90%
FTQ = 95%
C/O =10min,1X/day
Scrap = none
Rework = 5%
operators = 3/shift
Capacity = 2230/day
V.A. = 58 sec
Dedicated: L,R
General Information
- 20 days/month
- 7.2 hours
avail./shift
- 2 shifts/day
4 days
3 sec
8 days
36 sec
4.5 days
20 sec
2 days
58 sec
4.5 days
23 days
117 sec